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EXAMINER

SCHINDLER, DAVID M

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/517,895	Applicant(s) INOUE, MASAHIRO	
	Examiner David M. Schindler	Art Unit 2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This action is in response to the communication filed 3/12/2007. Upon further consideration, the previously indicated allowable subject matter is withdrawn.

Response to Arguments

2. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

With regard to the newly added claim 21, note Figure 2 of Watanabe in combination with Figure 4.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, 1) the inner rings fitted in an outer periphery of the hub wheel and a nut mounted on one end side of the hub wheel in an axial direction for connecting the inner rings to the hub wheel as claimed in claim 8 in the combination, and 2) the inner rings mounted outside the small-diameter outer periphery of the hub wheel and the rotor being formed by notches provided in a plurality of areas on an circumference of a large-diameter outer peripheral surface with a large diameter of the

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hub wheel of claim 10 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Claim Objections

4. Claim 6 is objected to because of the following informalities:

As to Claim 6,

The phrase "said inner rings respectively have inner ring outer surface end portion" on line 5 is awkward.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 8, 10, and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As to Claim 8,

The phrase "inner rings fitting in an outer periphery of

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said hub wheel" on line 4 appears to lack enablement as no embodiment appears to disclose inner rings, a rolling element, a non-rolling element, a rotor, and a stator.

The phrase "a nut mounted on one end side of the hub wheel in an axial direction for connecting the inner rings to the hub wheel" on lines 5-6 also appears to lack enablement as no embodiment appears to disclose this feature in the combination.

As to Claim 10,

This claim is rejected for similar reasons to that of the above claim 8.

As to Claim 11,

This claim is rejected for similar reasons to that of the above claim 8.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 3-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to the below rejections, the following is

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unclear in view of the specification and drawings. The following is a non-exhaustive list of issues. It is respectfully requested that applicant review the claims to address all clarity issues. It is not that many phrases appear throughout the claims that address outer or inner surfaces and diameters. These claimed features are not clear. Note for example the below rejection of claim 10.

As to Claim 3,

The phrase "a rotor provided in said rolling element" on line 9 is unclear as it is not clear how the rotor is provided in the rolling element.

The phrase "a stator provided in said non-rolling element" on line 10 is unclear as it is not clear how the stator is provided in the non-rolling element.

The phrase "said stator being formed with a plurality of polar teeth provided in a surface" on lines 16-17 is unclear as it is not clear how the plurality of teeth are provided in the surface.

The phrase "said rotor comprising a flat portion formed on a circumference of the surface in said rolling element which opposes said plurality of polar teeth provided in said non-rolling element" on the last three lines is unclear as it is not clear how the flat portion is formed on a circumference of the

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surface in the rolling element, and it is not clear how the polar teeth are provided in the non-rolling element.

As to Claim 4,

The phrase "a rotor provided in said rolling element" on line 9 is unclear as it is not clear how the rotor is provided in the rolling element.

The phrase "a stator provided in said non-rolling element" on line 10 is unclear as it is not clear how the stator is provided in the non-rolling element.

As to Claim 5,

The phrase "a rotor provided in said rolling element" on line 9 is unclear as it is not clear how the rotor is provided in the rolling element.

The phrase "a stator provided in said non-rolling element" on line 10 is unclear as it is not clear how the stator is provided in the non-rolling element.

As to Claim 6,

The phrase "said second inner peripheral surface has a greater diameter" on line 14 is unclear as it is not clear how the peripheral surface has a diameter.

The phrase "said inner ring outer surface end portion of another one of said inner rings" on lines 14-15 is awkward,

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unclear, and lacks clear antecedent basis. This phrase is repeated on lines 16-17 and 17-18.

As to Claim 9,

The phrase "a hub wheel with a flange provided in an outer periphery closer to an end of one spindle in an outward-radial direction while having an outer peripheral surface with a small diameter in an outer peripheral surface on an end of vehicle inner side" on lines 3-5 is not clearly understood.

The phrase "an inner ring mounted outside the small-diameter outer peripheral surface of said hub wheel" on lines 6-7 is not clearly understood.

The use of the term "spindle" on line 4 is not clearly understood.

The phrase "nut spindle portion" on line 8 is not clearly understood.

As to Claim 10,

The phrase "a hub wheel with a flange provided in an outer periphery closer to an end of one spindle in an outward-radial direction while having an outer peripheral surface with a small diameter in an outer peripheral surface on an end of vehicle inner side" on lines 17-21 is not clearly understood.

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The phrase "inner rings mounted outside the small-diameter outer peripheral surface of said hub wheel" on lines 22-23 is not clearly understood.

The phrase "an circumference of a large-diameter outer peripheral surface with a large diameter of said hub" on the last two lines is not clearly understood.

As to Claim 11,

The phrase "a hub wheel with a flange provided in an outer periphery closer to an end of one spindle in an outward-radial direction while having outer peripheral surfaces with a large diameter and a small diameter in an outer peripheral surface on an end of said vehicle inner side and having an inner ring raceway groove in said large-diameter peripheral surface" on lines 17-23 is not clearly understood.

The phrase "inner rings mounted outside the small-diameter outer peripheral surface of said hub wheel" on lines 24-25 is not clearly understood.

The term "PCD" on line 34 is not clearly understood.

As to Claim 19,

The phrase "a resolver which induces a voltage according to a gap permeance between said rotor and said stator in response to an exciting voltage inputted to said exciting winding from said output windings" on the last three lines is not clearly

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understood. The difference between the components of the rotation detector and the resolver are not clear. Furthermore, it does not appear that the resolver performs the above function. See for example lines 8-19 of page 15 of applicant's specification.

Due to the informal nature of claims 6, 9, 10, and 11, an art rejection is not being applied at this time.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 12, 13, 17, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al. (Watanabe) (5,914,548).

As to Claim 12,

Watanabe discloses a rolling element, a non-rolling element disposed concentrically with the rolling element, a rotation detector for outputting an induced voltage produced by an input exciting voltage according to a relative rolling state of the rolling element and the non-rolling element, and a generator

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(note (45) in Figure 3) for generating a voltage in accordance with rotation of the rolling element and inputting as an input exciting voltage to the rotation detector ((Figures 2-4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

As to Claim 13,

Watanabe discloses a generating rotor provided in the rolling element by disposing magnetic poles magnetic poles with different polarities alternately in a circumferential direction, and a generating stator provided in the non-rolling element, which has an electric coil opposing the magnetic poles of the generating rotor in an radial direction ((Figures 2-4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

As to Claim 17,

Watanabe discloses a signal processing unit for processing output signals from the generator (Column 9, Lines 4-19).

As to Claim 21,

Watanabe discloses a rolling element including a first raceway wheel, a non-rolling element disposed concentrically with the rolling elements and including a second raceway wheel,

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the rolling element rolling with respect to the non-rolling element, a rotation detector providing an induced voltage output produced from an input voltage and influenced according to a gap permeance related to a relative rolling state of the rolling element and the non-rolling element, a rotor disposed in the rolling element, a stator disposed in the non-rolling element, an exciting winding and output windings disposed on the stator, the exciting winding being excited by the exciting voltage and the output winding providing the induced voltage output, the rotor and the stator being disposed opposing one another in an annular space between the rolling element and the non-rolling element (note Figure 2 in conjunction with Figure 4), and the output windings outputting the induced voltage at a level determined by the gap permeance between the rotor and the stator and by the input exciting voltage ((Figures 2-4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 3, 4, 16, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (Watanabe) (5,914,548) in view of TAJIMA et al. (TAJIMA) (JP 11313470).

As to Claim 3,

Watanabe discloses a rolling element, a non-rolling element disposed concentrically with the rolling element, and a rotation detector for outputting an input exciting voltage by converting it to an induced voltage according to a relative rolling state of the rolling element and the non-rolling element, the rotation detector including a rotor provided in the rolling element, a stator provided in the non-rolling element, and an exciting

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winding and output windings wound to the stator, wherein the output windings induce a voltage according to a gap permeance between the rotor and the stator in response to the exciting voltage inputted to the exciting winding, the stator being formed with a plurality of polar teeth provided in a surface of the non-rolling element which opposes the rolling element while the exciting winding and output windings are wound to each polar teeth of the stator ((Figures 2 and 4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

Watanabe does not disclose the rotor includes a flat portion formed on a circumference of the surface in the rolling element which opposes the plurality of polar teeth provided in the non-rolling element.

TAJIMA discloses the rotor includes a flat portion formed on a circumference of the surface in the rolling element which opposes the plurality of polar teeth provided in the non-rolling element (Figure 4).

It would have been obvious to a person of ordinary skill in the art to modify Watanabe to include the rotor includes a flat portion formed on a circumference of the surface in the rolling element which opposes the plurality of polar teeth provided in

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the non-rolling element as taught by TAJUMA in order to advantageously utilize a readily available rotor which allows for a low-cost, compact angle detecting device (Abstract, Problem to be Solved).

As to Claim 4,

Watanabe discloses a rolling element, a non-rolling element disposed concentrically with the rolling element, and a rotation detector for outputting an input exciting voltage by converting it to an induced voltage according to a relative rolling state of the rolling element and the non-rolling element, the rotation detector including a rotor provided in the rolling element, a stator provided in the non-rolling element, and an exciting winding and output windings wound to the stator, wherein the output windings induce a voltage according to a gap permeance between the rotor and the stator in response to the exciting voltage inputted to the exciting winding, the rolling element being an inner ring, the rotor being formed by an outer peripheral shoulder of the inner ring((Figures 2 and 4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

Watanabe does not disclose a flat portion being formed on a circumference of the outer peripheral shoulder.

TAJIMA discloses a flat portion being formed on a circumference of the outer peripheral shoulder (Figure 4).

It would have been obvious to a person of ordinary skill in the art to modify Watanabe to include a flat portion being formed on a circumference of the outer peripheral shoulder as taught by TAJUMA in order to advantageously utilize a readily available rotor which allows for a low-cost, compact angle detecting device (Abstract, Problem to be Solved).

As to Claim 16,

Watanabe discloses a signal processing unit for processing output signals from the rotation detector (Column 9, Lines 4-19).

As to Claim 19,

Watanabe discloses the rotation detector includes a rotor provided in the rolling element, a stator provided in the non-rolling element, an exciting winding and output windings wound to the stator, and further includes a resolver which induces a voltage according to a gap permeance between the rotor and the stator in response to an exciting voltage inputted to the exciting winding from the output windings ((Figures 2-4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

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As to Claim 20,

Watanabe discloses the non-rolling element opposes the rolling element at least in part in a radial direction of the rolling bearing apparatus (Figures 2-4).

14. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al. (Watanabe) (5,914,548) in view of Rigaux et al. (Rigaux) (5,624,192).

As to Claim 5,

Watanabe discloses a rolling element, a non-rolling element disposed concentrically with the rolling element, and a rotation detector for outputting an input exciting voltage by converting it to an induced voltage according to a relative rolling state of the rolling element and the non-rolling element, the rotation detector including a rotor provided in the rolling element, a stator provided in the non-rolling element, and an exciting winding and output windings wound to the stator, wherein the output windings induce a voltage according to a gap permeance between the rotor and the stator in response to the exciting voltage inputted to the exciting winding, the outer ring having two outer ring raceway grooves in an inner peripheral surface thereof, the stator being provided in a region between the outer ring raceway grooves of the outer ring, the two outer ring

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raceway grooves being separated away each other in an axial direction ((Figures 2 and 4) and (Column 4, Lines 44-62) and (Column 6, Lines 40-54 and lines 66-67) and (Column 7, Lines 1-37) and (Column 9, Lines 19-25 and lines 55-67) and (Column 15, Lines 11-21)).

Watanabe does not disclose the rolling element being made of two inner rings disposed adjacent to each other in an axial direction and each having an inner ring raceway groove, the rotor being provided at an area whereat outer peripheral surface of areas of the two inner rings oppose each other in the axial direction, the non-rolling element being an outer ring disposed concentrically with the two inner rings in an outward-radial direction, the two outer ring raceway grooves opposing respective ones of the inner ring raceway grooves of the two inner rings.

Rigaux discloses the rolling element being made of two inner rings disposed adjacent to each other in an axial direction and each having an inner ring raceway groove, the rotor being provided at an area whereat outer peripheral surface of areas of the two inner rings oppose each other in the axial direction, the non-rolling element being an outer ring disposed concentrically with the two inner rings in an outward-radial direction, the two outer ring raceway grooves opposing

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respective ones of the inner ring raceway grooves of the two inner rings (Figure 1).

It would have been obvious to a person of ordinary skill in the art to modify Watanabe to include the rolling element being made of two inner rings disposed adjacent to each other in an axial direction and each having an inner ring raceway groove, the rotor being provided at an area whereat outer peripheral surface of areas of the two inner rings oppose each other in the axial direction, the non-rolling element being an outer ring disposed concentrically with the two inner rings in an outward-radial direction, the two outer ring raceway grooves opposing respective ones of the inner ring raceway grooves of the two inner rings as taught by Rigaux in order to advantageously utilize a readily available configuration to provide for the detecting of the speed of rotation (note Column 1, Lines 5-9).

As to Claim 7,

Watanabe discloses the exciting winding and the output windings are lead out from a through-hole provided in the outer ring ((Figure 4) and (Column 7, lines 31-36)).

Watanabe does not disclose the exciting winding and the output winding are lead out from a through-hole provided in an area on a center of a circumference of the outer ring in an axial direction.

However, it would have been obvious to a person of ordinary skill in the art to modify Watanabe to include the exciting winding and the output winding are lead out from a through-hole provided in an area on a center of a circumference of the outer ring in an axial direction as it would be a mere rearrangement of the location of the through-hole and thus a person of ordinary skill in the art would apply the above modification in order to rearrange the location of the through-hole to a desired location (MPEP 2144.04).

Allowable Subject Matter

15. Claims 8 and 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. The following is an examiner's statement of reasons for allowance:

As to Claim 8,

The primary reason for the allowance of claim 8 is the inclusion of a nut mounted on one end of the hub wheel in an axial direction for connecting inner rings to the hub wheel, wherein the nut serves as the rotor. It is these features found

in the claim, as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on Monday-Friday (8:00AM-5:00PM).

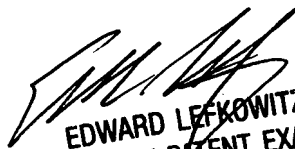
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

David M. Schindler
Examiner
Art Unit 2862

DMS


EDWARD LEFKOWITZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800